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A new species of genus *Zargus* WOLLASTON 1854 from Madeira (Coleoptera, Carabidae, Licinini)

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Abstract: *Zargus putzeri* nov.sp. is described from Madeira (type locality: Madeira, route Pico do Arieiro>Pico Ruivo, 1500 m), belonging to the group of species (*Z. schaumii* WOLLASTON 1854, *Z. desertae* WOLLASTON 1854) with strongly or weakly interrupted elytral striae, consisting of a series of elongate impressions strongly deepened or at least with a tendency to be interrupted. Illustrations of the habitus of the three species of this group, the labrum and the apical portion of the left elytron of the new species and of *Z. desertae*, and the gonocoxits and hemisternite and a photo of the surroundings of the biotop of the new species are presented. A key to the species of this group is given.

Key words: Coleoptera, Carabidae, Licinini, *Zargus*, new species, Madeira.

Introduction

The tribe Licinini BONELLI 1810 is represented on Madeira with two genera, the endemic genus *Eurygnathus* WOLLASTON 1854 (belonging to subtribe Licinina BONELLI 1810), with *E. latreillei latreillei* (LAPORTE 1834) from Porto Santo, and with *E. latreillei wollastoni* COCKERELL 1922 from Deserta Grande, and with genus *Zargus* WOLLASTON 1854 (belonging to subtribe Lestignathina BALL 1992), endemic to Madeira and the Canary Islands, on Madeira with *Z. desertae* WOLLASTON 1854 (Deserta Grande), *Z. monizii* WOLLASTON 1860 (Madeira main isle), *Z. pellucidus* WOLLASTON 1854 (Madeira main isle and Deserta Grande), and *Z. schaumii* WOLLASTON 1854 (Madeira main isle), on Gomera, Canary Islands with *Z. crotchianus* WOLLASTON 1865.

Taxonomic, phylogenetical, and biogeographical aspects within Licinini have been discussed by, among others BALL, l.c.; MACHADO 1992, SIAKY & FACCHINI 1997.

The last *Zargus* species WOLLASTON described in 1860, and it seemed that our knowledge about the species composition of this genus is complete but surprisingly recent collecting on Madeira has led to the discovery of a further species unknown to science which description is the subject of this short paper.

Material

The material examined is housed in the collections listed below:

MNHUB.....Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (M. Uhlig, B. Jaeger)

cWRCollection D.W. Wrase, Berlin, Germany

Methods

Total body length (BL) is measured from the tip of the apical margin of clypeus to the apex of the right elytron as the maximum linear distance; the width of the head (HW) as the maximum linear distance across the head, including the compound eyes; the length of the pronotum (PL) from the anterior to the posterior margin along the midline; the length of the elytra (EL) from the tip of scutellum to the apex of the right elytron as the maximum linear distance; the width of the pronotum (PW) and elytra (EW) at their broadest point; the width of the pronotal base (PBaW) between the tip of the posterior angles at insertion of seta, and the width of the pronotal anterior margin (PAW) between the tips of the anterior angles; the length of metatarsus (MTL) from visible part behind knee to outer apex.

These measurements, made at a magnification of 10× (body length) and 20×, respectively, and using an ocular micrometer in a Leica MZ 16 stereobinocular microscope, were combined as ratios and/or added as follows:

BL: total body length;

PW/PL: width /length of pronotum;

PW/HW: width of pronotum /width of head;

PW/PBaW: width of pronotum/width of the pronotal base;

PBaW/PAW: width of the pronotal base/ width of pronotal anterior margin;

EL/EW: length/width of elytra;

EW/PW: width of elytra/width of pronotum;

BL/MTL: body length/length of metatarsus.

Microsculpture was examined at a magnification of 100×.

Line drawings were prepared using an ocular grid (15 × 15 squares) attached to a Leica MZ 16 stereobinocular microscope. Dissections were made using standard techniques; genitalia were preserved in Euparal on acetate labels, and pinned beneath the specimens from which they had been removed. The habitus photographs were taken with a Nikon D 300 digital camera and Nikon Macro 105 mm. Post-processing was done in Adobe Acrobat Professional 7.0. To achieve sufficient depth of focus, 20 planes were captured which were copied to separate layers, and the out-of-focus planes are masked by the stacking programme Helicon Focus.

In type specimens the label text is cited as originally given, using a forward slash for separating different lines.

Comparison material

Zargus schaumii WOLLASTON 1854

Syntypes: 1♂: "42668" (black print on white label), "Zargus m. / Schaumii m. / Madeira" (handwritten by Wollaston on white label); 1♂, 1♀ with only the printed number labels. All specimens with labels subsequently added: "Hist. Coll. (Coleoptera / Nr. 42668 / Zargus Schaumii Woll.* / Madeira, Coll. Schaum / Zool. Mus. Berlin" (black print on white label); "SYNTYPE" (black print on red label); "Zargus / schaumii WOLLASTON, 1854 / WRASE det. 2009" (black print on white label, MNHUB).

Other material: Env. Rocha Negra, Levada do Ribeiro do Inferno, 1000 m, 19.IX.1987, D. Erber leg. (1♂, MNHUB); Levada da Portela, ca. 1.2 km W Portela, casa forestal, 700-750 m, 6.X.1997, B. & D. Jaeger leg. (1♀, MNHUB); Rabaçal, 105 m, 31.III.1993, V. Assing leg. (1♂, cWR); Rabaçal, 1100 m, 31.III.1993, P. Wunderle leg. (1♂, cWR); 4 km S Seixal (Laurisilva), 500 m, 26.VII.2000, Chr. Bayer leg. (1♂, 2♀♀, cWR); Ribeiro do Seixal, 550 m, 32°47'N/017°06'W, 31.III.1996, A. Lompe leg. (1♂, cWR); E Boca da Encumeada, Pico da Cabra, 1250 m (moss, ferns, Erica, Rhododendron), 11.I.2001, M. Schülke leg. (1♂, 1♀, cWR); 1 km N Poiso, Ribeiro Frio, 1.-4.VIII.1984, M. Balke & L. Hendrich leg. (1♀, cWR).

Zargus desertae WOLLASTON 1854

Syntype: 1♂: "42669" (black print on white label), "Zargus / Desertae m. / Deserta Grande" (handwritten by Wollaston on white label); with labels subsequently added: "Hist. Coll. (Coleoptera / Nr. 42669 / Zargus Desertae Woll.* / Deserta grande / Coll. Schaum / Zool. Mus. Berlin" (black print on white label); "SYNTYPE" (black print on red label); "Zargus / desertae WOLLASTON, 1854 / WRASE det. 2009" (black print on white label) (MNHUB).

Other material: "Zargus desertae Woll" (handwritten on white label), "Coll. L.W. / Schaufuß" (black print on white label) (1♂, MNHUB).

A further female without any labels was arranged behind this specimen, it cannot be excluded that it deals with a second syntype of *Z. desertae*, as the old collection catalogue listing the historical material including types mentions a second syntype which is missing.

Description

Zargus putzeri nov.sp.

Type material: Holotype ♀: "PORTUGAL Madeira / route Pico do Arieiro> / Pico Ruivo 1500 m, below / nesting colony of *Pterodroma* / *madeira* (MATHEWS 1934) / (Genista-Erica arborea zone, moist litter, sifted) / 8.XI.2006 D. Putzer" (cWR).

Diaagnosis: A typical *Zargus* species of large size (with all characters given by MACHADO 1992: 445: head elongate, two supraorbital setae, clypeus widely excavate, labrum bilobed, V-shaped, with base widely membranous, mentum without tooth, mandibles elongate, bidentate, ligula membranous, bisetose, paraglossa weakly protruding, labial palpomere 2 bisetose, antennae fine and long, pubescent from antennomere 4, pronotum distinctly flattened along margin, elytra with scutellar pore puncture in interval 1 and with two pore punctures in or at stria 2, hindwings reduced to small relicts). Body reddish piceous, with a very faint brassy tinge, appendages yellowish with tarsi somewhat infuscated. Pronotum almost quadratic, elytra ovate with striae somewhat irregu-

larly interrupted, and consisting of a series of shallow, elongate impressions. Habitus see Fig. 1.

Description: Body length 9.4 mm; width 4.29 mm.

Colour: Body reddish piceous, with a very faint brassy tinge, elytral interval 7 and 8 somewhat infuscated, margins of pronotum and elytra somewhat lightened, appendages yellowish with tarsi somewhat infuscated.

Head (Fig. 1) elongate, much narrower than pronotum (ratio PW/HW: 1.67). Eyes small and fairly flat, eye diameter about 3.64 times as long as almost rectilinearly narrowed tempora (seen in dorsal view). Lobes of labrum wide (Fig. 5), widely rounded at tip. Antennae long, slender, reaching scarcely to middle of elytra, pubescent from antennomere 4.

Pronotum (Fig. 1) almost square (ratio PW/PL: 1.25), widest at about end of anterior third, shortly behind insertion of lateral seta. Anterior margin strongly emarginate, anterior angles somewhat acutely projecting forward, rounded at tip, from there slightly curved laterally till insertion of lateral seta, from there basad almost rectangularly narrowed to posterior angles which are rounded and angled strongly forward, at insertion of seta very weakly angulate. Base medially slightly emarginate, laterally to insertion of seta strongly curved (ratio PW/PBaW: 1.16), distinctly wider than anterior margin (ratio PBaW/PAW: 1.27). Distinctly flattened along lateral margin, the latter somewhat reflexed anterior to posterior angles, disc flat. Medial longitudinal impression fine, not deeply impressed, terminated at anterior transverse impression and, becoming indistinct, terminated somewhat anterior to basal margin, posterior transverse impression indistinct, basal impressions round and shallow, whole pronotum impunctate, around termination of longitudinal impression at base somewhat weakly longitudinally wrinkled.

Elytra (Fig. 1) ovate (ratio EL/EW: 1.37), with rounded humeri, widest somewhat behind middle, flat on disc. Basal bead strongly sinuate, strongly curved inside humerus, weakly curved towards lateral margin, subapical lateral sinuation weak, sutural angle somewhat angulate (Fig. 7). Scutellar pore puncture present in interval 1, two pore punctures in stria 2, the first one shortly anterior to middle, the second one about at beginning of apical fourth. Striae fine, somewhat irregularly interrupted, and consisting of a series of shallow, elongate impressions. Umbelliculate series of left elytron with 13 setigerous punctures (forming three groups: 5+1+7), at right side consisting of 15 punctures in a row with punctures of somewhat greater distance from each other at middle. Elytra obviously fused together at suture, relicts of hindwings after removing of abdomen not visible, in all probability extremely reduced.

Sterna: Impunctate, abdominal sternites laterally somewhat wrinkled. Metepisternum short, ventral margin about as long as anterior margin. Last sternite with about 14 seta subapically and with two setae inserted at middle somewhat anterior to them.

Legs shorter and rather more robust than in *Z. schaumii* but somewhat longer than in *Z. desertae*.

Microsculpture mesh pattern on upper surface consisting of strongly engraved isodiametric meshes, causing a surface fairly matt.

Median lobe of aedeagus: Unknown.

Female genitalia (Fig. 9): Hemisternite asymmetrical, with some longer and shorter bristles apically. Basal stylomere without setae, apical stylomere moderately curved, with

a fine double-sensilla in a furrow at external margin shortly anterior to apex, with one peg-like seta at external margin about at middle, and with two peg-like setae at internal margin anterior to apex.

C o m p a r i s o n s : The new species belongs to the group of species with strongly interrupted elytral striae, consisting of a series of elongate impressions strongly deepened (*Z. schaumii* WOLL.), or with light striae having a weak tendency to be interrupted with shallow, not very noticeable elongate impressions (*Z. desertae* WOLL.).

Z. putzeri nov.spec. has a somewhat intermediate position between these species, it shares with *Z. schaumii* the flattened elytra with subapical lateral sinuation weak and with sutural angle somewhat angulate (Fig. 7), the labrum with lobes wider, not acuminate, widely rounded at tip, and the reddish piceous coloration of the body, often with a very faint brassy tinge (in *Z. desertae* elytral disc weakly convex, with subapical lateral sinuation missing or only indicated (Fig. 8), labrum with lobes narrow, acuminate, only weakly rounded at tip, compare Figs 5 and 6, and body piceous black). In construction of the pronotum and with its legs shorter and rather more robust it is closer to *Z. desertae*. Its elytral elongate impressions are distinctly more shallow than in *Z. schaumii* but stronger than in *Z. desertae* which has only indicated impressions.

The gonocoxites and hemisternites (Fig. 9) are similar to each other in the species in question, but more material is wanted to realize if small differences are constant. Ratios (see table 1) can show only tendencies as the number of available specimens was limited. Many values are fairly variable (the fairly strong intraspecific variability probably can be explained by the circumstance that specimens of different populations were investigated which have no contact to each other due to aptery), values between species overlap partly. The ratio PW/PBAW shows in *Z. putzeri* nov.spec. the lowest value, and the ratio PBAW/PAW is the highest, not overlapping with the values of the remaining two species, but more material is needed to confirm consistence. But other external characters revealed clear differences between these three species which can be differentiated in the following key. For data on variation in some values among *Zargus* species see table 1.

The other congeners of *Zargus* from Madeira (*Z. pellucidus* WOLL. and *Z. monizii* WOLL.) have the elytra regularly and fairly deeply striate with striae having no tendency to be interrupted, and are additionally of smaller body size, therefore *Z. putzeri* nov.spec. on these characters alone cannot be confused with these species.

Key to species of *Zargus schaumii*-group

- 1 Elytral striae interrupted at about regular intervals, consisting of a series of elongate impressions strongly deepened. Pronotum cordiform with lateral sides towards posterior angles more or less rectilinearly or even weakly sinuately narrowed, on disc usually strongly wrinkled. Antennae and legs long and slender (ratio BL/MTL about 3.12). Madeira main isle..... *Z. schaumii* WOLL.
- Elytral striae interrupted less regularly, the elongate impressions flat or only suggested. Pronotum subquadrate with lateral sides towards posterior angles more or less weakly rounded, or almost rectangularly narrowed, on disc usually less strongly wrinkled. Antennae and legs shorter and rather more robust (ratio BL/MTL about 3.21-3.30).....2
- 2 Elytral striae with a weak tendency to be interrupted with shallow, not very noticeable elongate impressions, disc weakly convex, subapical lateral sinuation weak, each elytron broadly rounded apically (Fig. 8). Pronotum with lateral sides towards posterior angles more or less weakly rounded. Labrum with lobes narrow, acuminate, only weakly rounded at tip (Fig. 6). Legs shorter (ratio BL/MTL about 3.30). Body

- piceous black with margins of pronotum and elytra narrowly lightened, legs more or less darkened. Deserta Grande. *Z. desertae* WOLL.
- Elytral striae with stronger and deeper elongate impressions (but not as strong as in *Z. schaumii*), disc flattened, subapical lateral sinuation stronger, sutural angles somewhat angulate (Fig. 7). Pronotum with lateral sides towards posterior angles almost rectangularly narrowed. Labrum with lobes not acuminate, wider, widely rounded at tip (Fig. 5). Legs somewhat longer (ratio BL/MTL 3.21). Body reddish piceous, with a very faint brassy tinge, margins of pronotum and elytra somewhat wider lightened, appendages yellowish with tarsi somewhat infuscated. Madeira main isle. *Z. putzeri* nov. sp.

E t y m o l o g y : I dedicate this new species very cordially to Dr. Dieterich Putzer (Karlsruhe) who, though not entomologist, collected with great talent extremely interesting beetle material on his scientific excursions.

D i s t r i b u t i o n : Up to now only known from the type locality.

H a b i t a t : The specimen was found in the *Genista-Erica arborea* zone by sifting moist litter. Fig. 4 shows the gorges and slopes below Pico do Arieiro in the area of the breeding ground of the Madeira petrel (*Pterodroma madeira* (MATHEWS 1934)), called also Zino's petrel (after Alexander Zino, who rediscovered this remarkable bird species which was said to be extinct, some decades ago).

Table 1: Data on variation in some values among *Zargus* species.

taxon	sex	n	BL/mm	PW/PL	Ø	PW/HW	Ø
<i>schaumii</i>	♂	5	9.1-10.1	1.18-1.26	1.22	1.51-1.63	1.58
<i>schaumii</i>	♀	5	9.7-11.1	1.21-1.23	1.22	1.51-1.67	1.56
<i>desertae</i>	♂	1	9.5	1.28	-	1.66	-
<i>desertae</i>	♀	2	8.4-8.8	1.31-1.33	1.32	1.70-1.80	1.75
<i>putzeri</i> HT	♀	1	9.4	1.25	-	1.67	-

HT: holotype

Table 1: Continuation

taxon	sex	n	PW/PBaW	Ø	PBaW/PAW	Ø	EL/EW	Ø
<i>schaumii</i>	♂	5	1.22-1.29	1.25	1.10-1.22	1.16	1.35-1.45	1.40
<i>schaumii</i>	♀	5	1.26-1.34	1.30	1.05-1.13	1.09	1.39-1.50	1.43
<i>desertae</i>	♂	1	1.20	-	1.21	-	1.38	-
<i>desertae</i>	♀	2	1.24-1.32	1.28	1.15-1.21	1.18	1.34-1.35	1.34
<i>putzeri</i> HT	♀	1	1.16	-	1.27	-	1.37	-

HT: holotype

Table 1: Continuation

taxon	sex	n	EW/PW	Ø
<i>schaumii</i>	♂	5	1.49-1.66	1.56
<i>schaumii</i>	♀	5	1.54-1.67	1.59
<i>desertae</i>	♂	1	1.50	-
<i>desertae</i>	♀	2	1.48-1.53	1.50
<i>putzeri</i> HT	♀	1	1.59	-

HT: holotype

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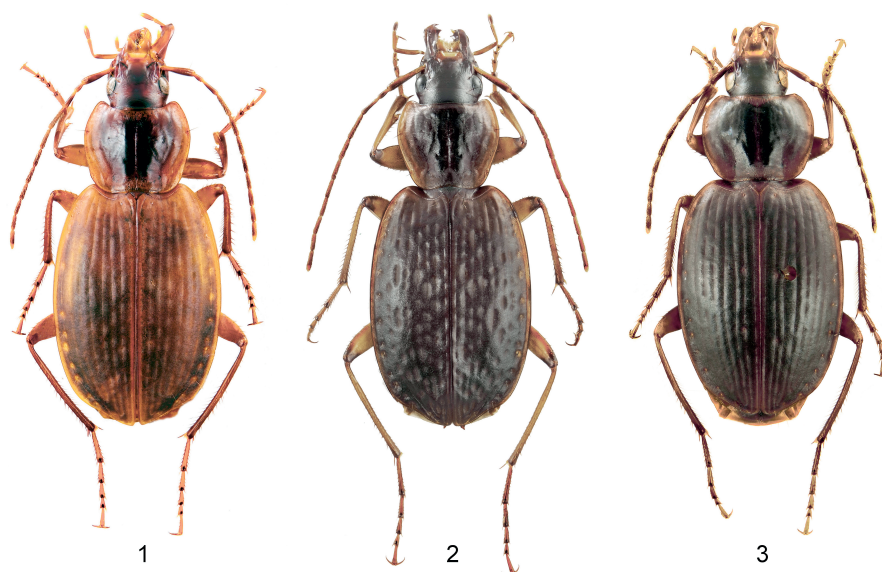
Zusammenfassung

Zargus putzeri nov.sp., gehörend zur Gruppe der Arten (*Z. schaumii* WOLLASTON 1854, *Z. desertae* WOLLASTON 1854) mit stark oder schwach unterbrochenen Streifen der Elytren, welche aus Serien von stark vertieften Längseindrücken bestehen oder aber eine Tendenz zur Unterbrechung zeigen, wird von Madeira beschrieben (locus typicus: Madeira, route Pico do Arieiro>Pico Ruivo, 1500 m). Der Habitus der drei zu dieser Gruppe gehörenden Arten wird abgebildet, dazu das Labrum sowie der Umriß des Apikalparts der linken Elytre der neuen Art sowie von *Z. desertae*, außerdem die Gonocoxite und das Hemisternit des weiblichen Genitals als auch die Umgebung des Biotops der neuen Art. Ein Schlüssel zur Unterscheidung der Arten der Gruppe wird gegeben.

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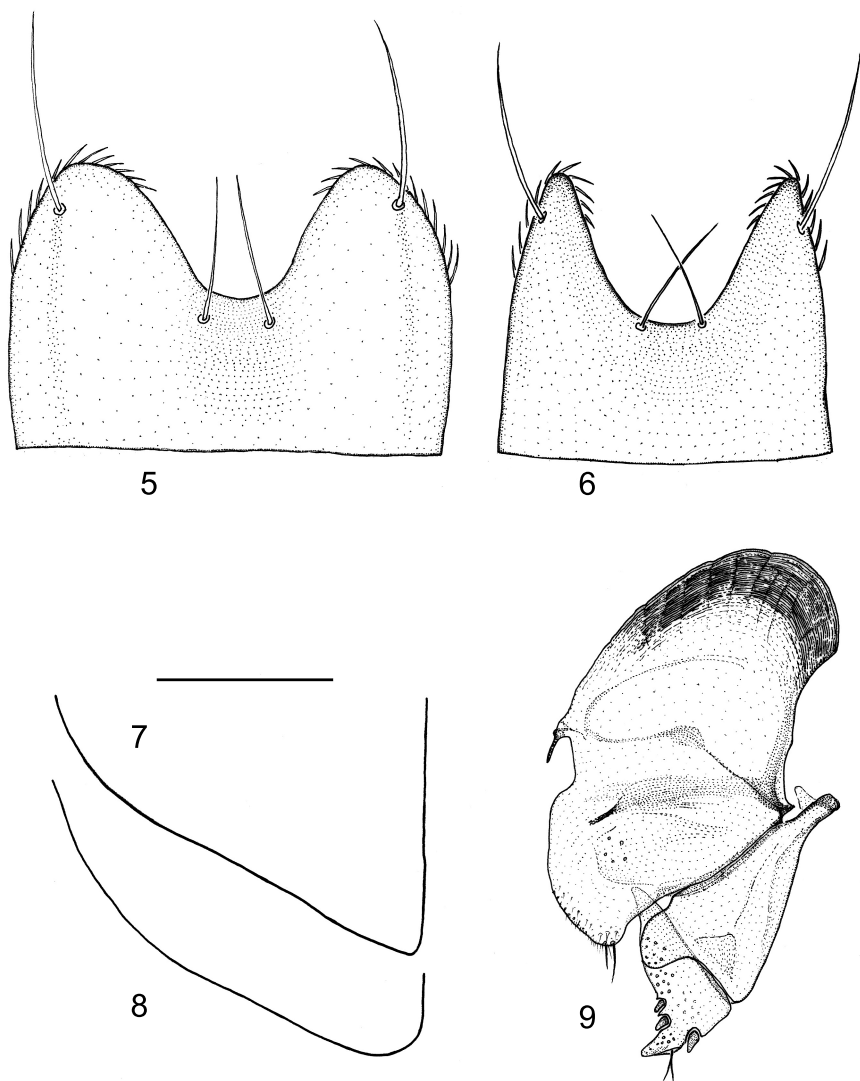
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Figs 1-3: *Zargus*, habitus: (1) *Z. putzeri* nov.sp.; (2) *Z. schaumii* WOLL.; (3) *Z. desertae* WOLL.



Fig. 4: Surroundings of the type locality of *Z. putzeri* nov.sp.



Figs 5-9: *Zargus*: **5, 6:** Apical part of labrum, dorsal aspect: **(5)** *Z. putzeri* nov.sp.; **(6)** *Z. desertae* WOLL.; **7, 8:** Outline of apical portion of left elytron, dorsal aspect: **(7)** *Z. putzeri* nov.sp.; **(8)** *Z. desertae* WOLL.; **(9)** *Z. putzeri* nov.sp., female genitalia, left hemisternite with gonocoxites, dorsal aspect; scale bar: 0.39 mm (5, 6); 1.6 mm (7, 8); 0.47 mm (9).